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RELATIONSHIP OF RACE, SEX AND GRADE TO RESPONSES, TO VERBAL AND PICTORIAL STIMULI. PART II, A STUDY IN SMALL SOUTHERN CITIES.

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FURTHER EXAMINATION WAS MADE OF AN EARLIER RESEARCH FINDING WHICH SHOWED, CONTRARY TO "LOGICAL" ANALYSIS, THAT VERBAL REPRESENTATIONS EVOKE MORE SENSORY RESPONSES THAN DO BLACK AND WHITE LINE DRAWING REPRESENTATIONS OF THE SAME STIMULI. THIS RESEARCH FINDING HAD BEEN CONFIRMED BY TWO EARLIER STUDIES WHOSE SUBJECTS WERE ALL WHITE STUDENTS IN A RURAL COMMUNITY HIGH SCHOOL IN THE NORTHWEST AND RACIALLY UNDIFFERENTIATED STUDENTS IN A NORTHERN METROPOLITAN HIGH SCHOOL. IT WAS SUGGESTED, HOWEVER, THAT SUBJECTS WITH OTHER BACKGROUNDS AND IN OTHER GRADE LEVELS MIGHT RESPOND DIFFERENTLY. TO TEST THIS CONTENTION, THE INVESTIGATOR ADMINISTERED THE SAME MATERIALS AND FOLLOWED THE SAME PROCEDURES EMPLOYED IN ONE OF THE EARLIER STUDIES WITH A STUDENT SAMPLE FROM TWO SMALL SOUTHERN CITIES. THE NEW SAMPLE CONSISTED OF ELEMENTARY AND SECONDARY STUDENTS IN A NEGRO SCHOOL AND ELEMENTARY STUDENTS IN A WHITE SCHOOL. ON AN OVERALL BASIS, THE RESULTS OF THE NEW STUDY CORROBORATED THE EARLIER FINDING. ONLY THE OUTCOMES DEMONSTRATED BY THE NEGRO ELEMENTARY SUBJECTS FAILED TO SUBSTANTIATE THE FINDING, AND A REPLICATION WITH YOUNG NEGRO STUDENTS WAS RECOMMENDED. THE EARLIER STUDIES HAD SHOWN A POSSIBLE DEVELOPMENTAL TREND TOWARD SENSORY RESPONSES. IN THE PRESENT STUDY, THE HIGH SCHOOL STUDENTS GAVE MORE SENSORY RESPONSES THAN THE ELEMENTARY SUBJECTS, BUT THERE WAS NO CLEAR TREND FROM ONE GRADE TO THE NEXT WITHIN SCHOOLS. GIRLS TENDED, AS IN THE EARLIER STUDIED, TO GIVE MORE SENSORY RESPONSES THAN BOYS. THIS PAPER WAS PRESENTED AS PART OF AN SYMPOSIUM AT AN ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION (CHICAGO, FEBRUARY 1966). (JH)

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RELATIONSHIP OF RACE, SEX AND GRADE TO RESPONSES TO VERBAL AND PICTORIAL STIMULI: II. A STUDY IN SMALL SOUTHERN CITIES

(A paper presented as part of a symposium on verbal pictorial presentations of stimuli at the annual meeting of the American Educational Research Association, Chicago, Illinois, February, 1966)

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Relationship of Race, Sex and Grade to Responses to Verbal and Pictorial Stimuli: II. A Study in Small Southern Cities

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Abstract

Two existing studies have shown - contrary to logical analysis - that verbal representations evoke more sensory responses than do pictorial representations of the same stimuli. Subjects in the respective studies were all white students in a rural community high school in the Northwest and racially undifferentrated high school students in a northern metropolitan high school. Again, logical analysis suggests that subjects with other backgrounds and other grade levels might respond differently. This, then, was one of two studies designed to further examine the generality of the previous finding. Subjects in the present study were pupils in grades 4 - 6 and 9 - 12 in a Negro school and pupils in grades 4 - 6 in a white school in two small southern cities. In general, the results showed the same trend as the earlier studies.

Relationship of Race, Sex and Grade to Reponses to Verbal and Pictorial Stimuli: II. A Study in Small Southern Cities[1]

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Two existing studies (Otto & Britton, 1965; Bourisseau, Davis and Yamamoto, 1965) have shown that verbal representations evoke more sensory responses than do pictorial representations of the same stimuli. The finding is intriguing because it is contrary to what seems a logically defensible expectation; that pictures would have a direct sensory appeal and thereby evoke sensory responses. Speculation regarding causes and implications is, however, limited by restrictions in the populations studied. Subjects in the respective studies were all white students in a Northwestern rural community high school and racially undifferentiated high school students in a northern metropolitan community. The present paper, then reports one of two follow-up studies -- both included in this symposium -- that were done specifically to examine the generality of the trend toward verbal-sensory associations by investigating the relationship of race, grade and sex to responses evoked by verbal and pictorial representations of the same stimuli.

Method

Materials and Procedure

A rationale for developing the verbal and pictorial stimuli used is stated elsewhere (Otto, 1964). Both the materials used and the procedures followed had been employed in one of the studies already cited (Otto, 1965).

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[1]A paper presented as part of a symposium on verbal-pictorial presentations of stimuli at the annual meeting of the American Educational Research Association, Chicago, February, 1966. Support for preparation of the paper was provided by a contract with the U.S. Office of Education, Department of Health, Education and Welfare, under the provisions of the cooperative research program. Center No. C-03, Contract OE5-10-154.

[2]The writer is grateful to Dr. Cochran of the Walton County (Georgia) Public Schools and Silas Morgan of the Whitfield County (Georgia) Public Schools for their help in obtaining subjects.

Very briefly, two variations of a list of 35 concrete nouns adapted from a list devised by Underwood and Richardson (1956) were used: (1) a pictorial list, where the nouns were presented by black and white line drawings, and (2) a verbal list, where the nouns were represented by the typewritten words. The nouns are given in Table 1. Subjects were instructed

Table 1
Stimulus Nouns Used in the Study

anchor	cigarette	goat	pail	skunk
apple	cradle	grasshopper	pear	snail
armour	dandelion	hog	pillow	tack
barrel	diamond	kitten	rabbit	teeth
bone	elephant	knife	rattlesnake	telephone
camel	eye	mouse	scissors	tomato
cigar	forest	needles	sheep	wheel

to give the single response to each stimulus that they "thought of first;" each subject responded to either verbal or pictorial stimuli. Stimuli were flashed by the experimenter and the subjects wrote their associations on numbered data sheets. A rapid rate of presentation -- 6 to 8 seconds -- was intended to keep subjects from selecting among responses. A warm-up period preceded the actual experimental presentations: stimuli were first presented slowly with the experimenter discussing the free-association responses of the subjects, and then the rate was speeded up to the rapid rate employed during the actual testing. As each verbal stimulus (typewritten word) was presented, the experimenter enunciated the word; pictorial stimuli were not named.

Subjects

Subjects were from three schools: an all-white elementary school (Dalton); an all Negro elementary school (Carver Elementary); and an all Negro high school (Carver High). At Dalton, one classroom of pupils in each grade from four through six responded to each mode of presentation; at Carver Elementary, one classroom from each grade from three through six responded to each mode; and at Carver High all students in each high school class nine through twelve responded to either verbal or pictorial stimuli. Exact numbers of subjects by school, grade and sex are given in the summary tables included in the discussion section of this paper.

Evaluation of Responses

As in the studies cited earlier, all responses were evaluated in terms of the forty sense impression categories devised by

Underwood and Richardson (1956). The categories are given in Table 2.

Table 2
Sense-Impression Response Categories

round	long	pointed	woody	fuzzy
small	yellow	slimy	sharp,strong,tangy	light (not heavy)
white	brown	black	heavy	square
hard	metallic	smooth	greasy	clear
smelly	green	dark	dirty	sticky
soft	sweet	sour-bitter	deep	narrow
shiny	red	hairy-furry	cold	rough
big	sharp	wet-moist	noisy	flat

Responses were judged to be sensory if they could be placed into one of the forty categories and non-sensory if they could not.

Results and Discussion

As in the earlier studies (Otto, 1964, 1965; Bourisseau, Davis and Yamamota, 1965) the great majority of free association responses was non-sensory. There were 24,360 responses in all, and only 3,842 were classified as sensory. Thus, the proportion of sensory responses -- 15.8 per cent -- in the present study was double the proportion reported by Bourisseau, Davis and Yamamoto (1965) but down substantially from the 26 per cent figure reported in Otto's (1964) earlier study. These discrepancies could be due either to perceptual differences in the fairly diverse populations studied or to differences in the methods of presentation from study to study, but at this point the most feasible explanation seems to be that the evaluation of responses lacks standardization. (To support the latter notion, it must be pointed out that in the present study an attempt was made to be more rigious because of the discrepancy between the earlier studies by Otto and by Bourisseau, Davis and Yamamoto. The result was a decrease in the discrepancy; but apparently the judges were still more liberabl than those employed by Bourisseau, Davis and Yamaoto.) Whether "enormous" means "big", whether "stinky" means "smelly", whether "color" is sensory, etc., are examples of the kinds of decisions that must be made when categorizations are made. It would be surprising if two independent sets of judges came up with identical decisions, even though each set of judges would no doubt categorize with high reliability within its particular set of criterion definitions. Obviously, it is time for independent experimenters to get together on evaluations of responses. Nevertheless, even though specific percentages may be affected, the gross general tendencies demonstrated within studies -- so long as there

is reliable within-study categorizing -- should be unaffected. Here there is support in the fact that there has been general agreement regarding response tendencies among existing studies.

Direct comparisons of the Bourisseau, Davis and Yamamoto findings and the present results are further limited by the fact that the methods of presentation differed. The former used three modes: verbal, pictorial and verbal-pictorial; they did not pronounce the written word. In this study there were two modes: verbal and pictorial; and the word was enunciated. Furthermore, it should be noted that the line drawings used in the two studies were not identical. One can only speculate upon the possible effects of whatever differences may exist.

The responses of the present subjects are presented, by school, in Tables 3, 4, and 5. Each subject was exposed to 35

Table 3
Dalton Subjects, Grades 3-6: Total Number of Subjects (N), Number of Subjects Giving No Sense-Impression Responses (N*), Per Cent Sensory Responses (SR), and Per Cent No Responses (NR) by Grade, Sex and Stimulus Mode

		Verbal Stimuli				Pictorial Stimuli			
Grade	Sex	N	N*	SR	NR	N	N*	SR	NR
3	M	15	9	.069	.232	22	5	.079	.160
	F	22	6	.109	.173	14	0	.173	.086
	SUM	37	15	.093	.197	36	5	.115	.130
4	M	17	5	.108	.992	24	4	.071	.123
	F	16	2	.139	.113	16	4	.127	.048
	SUM	33	7	.123	.102	40	8	.094	.093
5	M	18	0	.161	.040	16	3	.114	.105
	F	18	0	.263	.049	15	1	.150	.074
	SUM	36	0	.213	.044	31	4	.132	.090
6	M	13	0	.222	.013	14	0	.165	.063
	F	15	0	.261	.021	13	0	.174	.062
	SUM	28	0	.243	.071	27	0	.169	.062
4-6	M	48	5	.159	.051	54	7	.108	.102
	F	49	2	.222	.061	44	5	.149	.061
	SUM	97	7	.191	.056	98	12	.126	.084

verbal or pictorial stimuli. The percentages reported reflect the proportion of (a) sensory responses to total opportunities to respond and (b) failures to respond at all to total opportunities. In Table 3 cumulative totals are given only for grades four through six to make them comparable to those in Table 4. (See next page.) The Carver third grade subjects were dropped because many of them persisted in merely naming the pictorial stimuli.

No attempt was made at statistical analysis of between-group differences or trends. It was felt that more rigorous analysis of data would best be left until studies that are more rigorous in methodology and design have been run. Here we shall simply state the more salient

Table 4
Carver Subjects, Grades 4-6: Total Number of Subjects (N), Number of Subjects Giving No Sense-Impression Responses (N*), Per Cent Sensory Responses (SR), and Per Cent No Responses (NR) by Grade, Sex and Stimulus Mode

		Verbal Stimuli				Pictorial Stimuli			
Grade	Sex	N	N*	SR	NR	N	N*	SR	NR
4	M	9	3	.079	.254	8	1	.082	.092
	F	18	2	.233	.265	25	4	.075	.149
	SUM	27	5	.182	.261	33	5	.077	.135
5	M	19	2	.122	.129	9	1	.203	.095
	F	9	2	.162	.143	17	1	.266	.032
	SUM	28	4	.135	.134	26	2	.244	.024
6	M	22	3	.112	.057	18	0	.130	.059
	F	16	1	.170	.030	21	1	.154	.079
	SUM	38	4	.136	.046	39	1	.143	.069
4-6	M	50	8	.110	.120	35	2	.138	.054
	F	43	5	.195	.152	63	6	.153	.094
	SUM	93	13	.149	.135	98	8	.148	.079

Table 5
Carver Subjects, Grades 9-12: Total Number of Subjects (N), Number of Subjects Giving No Sense-Impression Responses (N*), Per Cent Sensory Responses (SR), and Per Cent No Responses (NR) by Grade, Sex and Stimulus Mode

		Verbal Stimuli				Pictorial Stimuli			
Grade	Sex	N	N*	SR	NR	N	N*	SR	NR
9	M	15	1	.196	.072	23	1	.180	.087
	F	39	0	.204	.052	20	2	.213	.057
	SUM	54	1	.202	.058	43	3	.195	.073
10	M	7	0	.122	.078	12	0	.233	.086
	F	19	0	.205	.036	15	0	.089	.013
	SUM	26	0	.182	.047	27	0	.144	.046
11	M	10	0	.151	.043	8	1	.118	.118
	F	8	0	.257	.021	15	0	.135	.063
	SUM	18	0	.198	.033	23	1	.129	.082
12	M	14	0	.216	.049	9	0	.130	.048
	F	7	0	.176	.024	16	0	.189	.046
	SUM	21	0	.203	.041	25	0	.168	.047
9-12	M	46	1	.181	.059	52	2	.169	.085
	F	73	0	.207	.041	66	2	.161	.046
	SUM	119	1	.197	.049	118	4	.165	.063

descriptive generalizations derived from examination of the data summarized in Tables 3, 4, and 5 in the hope that they will suggest directions for further study.

Overall, as in the earlier studies, the verbal stimuli evoked more sensory responses. This was generally true by sex and by grade

level, too, except in the case of the Carver Elementary subjects, who gave as many sensory responses to pictorial as to verbal stimuli. The high school subjects gave more sensory responses to both stimulus types than did elementary subjects.

In general, girls gave more sensory responses than boys, which is in agreement with the Bourisseau, Davis and Yamamoto finding. The notable exception is the group of Carver High subjects who responded to pictures, where there is no general sex difference.

Few subjects from any school gave no sensory responses: 9.1% of the Dalton subjects, 10.9% of the Carver Elementary subjects, and 2.1% of the Carver High subjects. The high school group, then, included fewer subjects who gave no sensory responses; but there are no clear trends by grade level. Likewise, there were relatively few instances in which subjects failed to respond to individual items: 7% for the Dalton subjects, 10.7% for the Carver Elementary subjects, and 3.2% for the Carver High subjects. In the Carver High group, the boys failed most frequently to respond; in the Carver Elementary group, the girls failed most frequently to respond; and in the Dalton group a trend by sex was not clear.

It is interesting to note that the Carver Elementary subjects gave equal proportions of sensory responses to both pictorial and verbal stimuli, unlike the other two groups. Likewise, they reversed the trend of the other two groups by failing to respond more often with verbal than with pictorial stimuli. This seems to be the only inkling of a race difference revealed by the data. Obviously, though, the difference could also be attributable to cultural background, lack of skill development in dealing with verbal symbols, the effect of working with a white examiner, etc.; race is merely the obvious grouping criterion.

The major finding seems to be the overall corroboration of the previously demonstrated trend of verbal stimuli to evoke more sensory responses with markedly different samples of pupils. The significance of the Carver Elementary subjects' failure to demonstrate the trend is not clear, for the most straightforward explanation could be simply that they responded less frequently to verbal stimuli and, thereby, had fewer opportunities to give sensory responses. In the previous studies there was a suggestion of a developmental trend toward sensory responses. Here the high school subjects gave more sensory responses than the elementary subjects, but there was no clear trend from one grade to the next within schools. Also, girls tended, as in the earlier studies, to give more sensory responses.

Some promising directions for related study and speculation regarding causes for the trends demonstrated have already been pointed out by Otto (1964) and by Bourisseau, Davis and Yamamoto (1965) and there is no need to restate them here. Some additional points might be considered: a replication with Negro elementary pupils should be attempted; it would probably be worthwhile to see that each subject responds to all stimuli; it would be interesting to see what would result if subjects were encouraged to give multiple responses to each stimulus.

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